

WIRELESS IMAGINATION

SOUND, RADIO, AND THE AVANT-GARDE

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The MIT Press

Cambridge, Massachusetts

London, England

INTRODUCTION

HISTORIES OF SOUND ONCE REMOVED

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One would expect to find amid the accumulation of studies of modernism, postmodernism, the avant-garde, and postwar experimentalism a more faithful attendance to the cultural preoccupations of hearing—one of the two major senses, the "public" ones, as John Cage described them for their ability to make contact from a distance—especially when one remembers that there are few arts that are mute. It would also be reasonable to expect a stronger curiosity about earlier artistic responses to the audio- and radiophonic technologies that so successfully submerge us now in a mass-media din. Yet the literature on the arts of recorded and broadcasted sound, and of conceptual, literary, and performative sound, is scant at all levels, from basic historical research to theoretical modelings. Thus, while other historical fields may be busying themselves with things more detailed, the study of the relationship of sound and radio to the arts is open to a full range of investigations, including the most general.

Only recently have individuals begun to describe themselves as sound and sound installation artists, audio and radio artists. Only recently have they been self-identified with projects such as the radicalization of sound/image relationships, or of acoustics in architectural, environmental, or virtual space. These individuals demand knowledge of their predecessors, and a history and theory of sound in the arts. Without it artists will remain deaf to the spinning sound of reinvented wheels, for there is no easy artistic escape from deficient discourse. As part of this project historians might undertake,

in the spirit of their own absence from the field, an investigation of what could have happened but didn't, that is, a *nonhistory*. Given developments within the avant-garde as a whole, given certain discursive, technological, and institutional conditions, why didn't certain practices ensue? This line of questioning—found in Rudolf Arnheim's 1936 *Radio* or Carlos Chavez's 1937 *Toward a New Music*, in which the fact that artists did not take advantage of the new possibilities presented by optical sound film, phonography, and archives of recorded sound stands as a source of bewilderment—needs to be pursued. Similarly, events that are usually excluded or trivialized in historical research should receive their due; after all, misguided aspirations, the oddest of infatuations, failed attempts, and unintentional accomplishments can often be more provocative than complete, final, and flawless realizations. Most of the events central to a history of sound have been nothing but marginalia on conventional historical agendas.

But this history presents problems at all levels, beginning with the fact that, despite the cultural pervasiveness of sound, there was no artistic practice outside music identified primarily with aurality. What took place was required to do so under other auspices: Marcel Duchamp was an antiretinal artist who focused on sound; Antonin Artaud was many things before he became involved in radio; Dziga Vertov took up film after his attempts to found a phonographic "Laboratory of Hearing" were frustrated; Piet Mondrian found time to ruminate at length on Luigi Russolo's noise music; William Burroughs was a writer who cut up audiotape; etc. There is no history of a self-described and autonomous art in the way one might think of the history of sculpture, no facade of a purposeful unity and linear continuity, no ongoing biographical intrigues and libidinal exchanges of influence. As a historical object, sound cannot furnish a good story or consistent cast of characters nor can it validate any ersatz notions of progress or generational maturity. The history is scattered, fleeting, and highly mediated—it is as poor an object in any respect as sound itself.

Another problem has been the privileging of music as the art of sound in modern Western culture.[1] Modernist and avant-garde artists admired the disjunctiveness and simultaneity that music could by its very nature perform, the "nonobjective" nature of its autoreferentiality, the dynamics between the rule of musical law and the sublime it administered, the mystical associations music holds, etc. In terms of many of the artistic agendas at hand, music had already auspiciously *arrived* and, therefore, suffered few challenges to its dominion—with one major exception: the French Surrealists' antipathy to music. Western art music proved at best awkwardly disposed to changes in mass culture and mass media, to new technological developments, to complex interaction with folk, subaltern, and non-Western cultures, and to overturning its most basic signifying presuppositions to the degree that other arts would, ironically, undertake in its name. Even this century's most noted radical attacks upon music—conducted, as they were, under the sign of noise and sound—ultimately returned to music. Luigi Russolo's "art of noises" was recuperated immediately into the goal of "a great renovation of music"; Edgar Varèse's "liberation of sound" was a motto of retreat when compared to Russolo's position; and at the core of John Cage's emancipatory project was a will to impose musical precepts upon all sounds. The main avant-garde strategy in music from Russolo through Cage quite evidently relied upon notions of noise and worldly sound as "extra-musical"; what was outside musical materiality was then progressively brought back into the fold in order to rejuvenate musical practice. This strategy was, of course, exhausted at the point when no audible sound existed outside music. But for a sound to be "musicalized" in this strategy, it had to conform materially to ideas of sonicity, that is, ideas of a sound stripped of its associative attributes, a minimally coded sound existing in close proximity to "pure" perception and distant from the contaminating effects of the world. This discursive block, bountiful in writings on Western art music, has inhibited the fusion of artistic ideas and activities with sociopolitical realities, with trenchant critiques and rapturous mo-

ments culled from aurality in general, with operations of the body and psyche, technological im/machinations, institutional workings—all that might be encountered beyond musical materiality.

Yet another problem exists in merely thinking about sound within a culture that so readily and pervasively privileges the eye over the ear. Visuality is so embedded that attempts at redress seem doomed to tautology. Many contemporary theories and philosophies, in fact, invoke aural, sonic, musical, and preguttural metaphors at the points where they are unable to speak, at the limits of language.[2] How can we then rely on the same theories and philosophies to query the very sounds heard during such moments of inarticulation? How, for instance, can listening be explained when the subject in recent theory has been situated, no matter how askew, in the web of the gaze, mirroring, reflection, the spectacle, and other ocular tropes? Visually disposed language, furthermore, favors thinking about sound as an object, but sound functions poorly in this regard: it dissipates, modulates, infiltrates other sounds, becomes absorbed and deflected by actual objects, and fills a space surrounding them. And the very attempt to establish a historical object, to understand the scattered, fleeting, and highly mediated history of sound, leads to an uncharacteristic state for sound itself. We are dealing here, however, with historical events that by their nature do not exist in inviolable perceptual or phenomenal states. They are necessarily cultivated amid the clutter of the sensorium and episteme. It is the task in these circumstances, then, to keep an eye on how at any specific moment the culture of visuality impinges upon the realms of sound and hearing as we speak about them. In my own attempt to underscore some larger attributes of the history of sound and radio in the avant-garde, I will first point to various artistic links to sound recording technologies and then propose a schema of three figures of sound operative in the arts since the late nineteenth century. These two approaches are not meant to displace the more complex analyses that occur at local levels but are instead offered here as other means of

exploration, ones that I hope will result in generating understanding closer to the topic at hand.

THE TECHNOLOGICAL RECORD

It is no coincidence that the essays in this volume deal primarily with sound mediated by technology. From the beginning of the modern artistic fixation on sound, which was concurrent with the phonographic capture of sound in the late nineteenth century, to contemporary media arts, the connection between sound and technology has endured. In fact, we only begin to really hear *about* sound as a cultural entity with the introduction of Cros' paleophone and Edison's phonograph right into the midst of ascendant modernist and avant-garde culture. The timing of the two was perhaps no coincidence, for here was a machined fusion of orality and literacy, the completed artistic/cultural incidence of sound per se and thus a foregrounding of the isolation of other perceptual objects and operations, the first articulate return of the selfsame voice as had been experienced with the mirrored face since the first self-consciousness of the species, the totalizing cornu/copia of all and every sound, a plenitude that true to its course would expansively reproduce itself through exchanges amid its newfound elemental state—a technological incursion into apperception and communication during the heyday of imperial expansion.

The phonograph provoked many responses from within the arts, no matter whether or not it could be employed as a technology in the making of art. The ideational mission of the phonograph, in fact, totally outstripped any practical application for decades to come, for its conceptual implications were much more accessible, mobile, and workable than its actual mechanics. Save for rare instances, the phonograph was simply not taken up in the arts as a topical concern; there were no portraits; instead, by making the boundaries between humans and machines, writing and voice, human

sounds and worldly sounds, music and noise, much more problematic, it lent itself to more important matters: if a machine like the phonograph could now talk, mock subjectivity, and invoke the dead, it followed that humans could record the previously unrecordable, the technologically inaccessible regions of consciousness or the mysterious. Voices could thus be installed to complete existing circuits of dread or desire, one example being how the famed *fin de siècle* misogyny so readily intersected with phonography. Apparently, the spectre of a technologization of humans sparked by the phonographic animation of voice proved to be a perfect outlet. Very soon after his friend Charles Cros placed his patent for his pre-Edisonian phonograph, Villiers de l'Isle-Adam began writing his novel *L'Eve future*, in which a fictional Edison, so-named, constructs a gynoid whose intelligence is given voice by two phonographs located where her lungs would have normally been and beneath where the synthetic breasts are. In Marcel Schwob's *La Machine à parler*, discussed in Charles Grivel's essay, a horrible monster operated by a woman from a keyboard frightens the narrator with its even more horrible phonemes. That the phonographic voice could live on after the body that had originally given rise to the voice had died provided the themes of reanimation of the dead found in both Maurice Renard's *La Mort et le coquillage* and Raymond Roussel's *Locus Solus*. Some phonographic literature incorporated the machine's technological attributes into their own operations. The violence of Alfred Jarry's *Phonographe* is simulated in the text itself, which skips into repetition like a faulty phonograph; we can also detect phonographic relations in Roussel's writing method, in his youthful ecstasy, and certainly in the scene in *Locus Solus* where a psychiatric patient of sorts attempts to write phonographically the voice of his daughter, who had been trampled to death by bandits.

Between how acts of writing were disposed to technology and how technology was later used in the arts, there was an inclination for authors and artists to internalize the attributes of phonography, to move it from representation closer to experience. For instance, Surrealism's founder André Breton brought principles of recording into his own body as a form of psychotechnics, implanting a trope into the brain where actual technology could not go. He used the term "modest recording instruments" in the 1924 *Manifesto* to speak of, among other things, automatic writing, that quasi-scientific transcription, the faithful recording of the incessant murmuring of the unconscious. The term had been derived, through the autoanalysis of French Dynamic Psychiatry, from telecommunications practices in the late nineteenth century, as noted in Christopher Schiff's essay in this volume.

Italian Futurism's founder, F. T. Marinetti, also technologized his body. In "Destruction of Syntax—Wireless Imagination—Words in Freedom" he clearly stated that deep-seated effects of modern technology upon body and soul were, in fact, inescapable. "Those who use the telephone today, the telegraph, the phonograph, the train, bicycle or automobile, the ocean liner, dirigible or airplane, the cinema or a great daily newspaper (the synthesis of a day in the whole world) do not dream that these diverse forms of communication, transportation and information exert such a decisive influence upon their psyches."[3] In 1911 Marinetti covered the Italo-Turkish War in Libya as a war correspondent for *L'Intransigeant* of Paris, and then, about a year later, he was in the Balkan War. His report from the trenches of Adrianopolis was an example of *parole in libertà* (words-in-freedom) that would appear in the 1914 collection *Zang-tumb-tuuum, Adrianopoli, ottobre 1912* as "Bombardment." In it Marinetti takes on the role of the phonograph by enacting an onomatopoetic reportage of the *ZANG-TUMB-TUUUMB* of the cannons, the *taratatata* of the machine guns, and other sounds interspersed with musical instructions. As he eagerly recounted, "I finished that short synthesizing noise-making poem while witnessing the machine-gunning of three thousand horses ordered by the Turkish general who was the governor before the fortress fell."[4] The

widespread influence of this poem, especially in its relation to the whole genre of *parole in libertà*—"Words-in-freedom were born on two battlefields Tripoli and Adrianople"[5]—can be followed into two important trends within the subsequent avant-garde: noise music and sound poetry. Luigi Russolo's 1913 "The Art of Noises" manifesto contained Marinetti's report from Adrianopolis under the guise of a personal correspondence and used it as a key rhetorical element; in fact Russolo's 1916 book of the same name contains a chapter entitled "The Noises of War." Likewise, in Zurich in 1916, with the war all around, Hugo Ball had Marinetti's *parole in libertà* as an inspiration for his famous Dada sound poetry performance at the Cabaret Voltaire. Thus, to the myriad of other less unseemly influences already acknowledged by historians that had a formative role on the avant-garde, experimental music, *bruitisme,* and sound poetry in this century, there must be added Marinetti's phonographic celebration of militarism.

The validity of utilizing actual phonographic technologies within artworks was recognized by many artists central to the history of the avant-garde, as it has been written. Among them was Guillaume Apollinaire, who, in his last major essay before his death, "The New Spirit and the Poets" (1918), criticized Marinetti's onomatopoetic practices of carrying the "new spirit to excess."[6] Excess ostensibly results from the reduction of poetry to a "kind of imitative harmony that would not even have the excuse of being exact."[7]

> *I, at least, cannot conceive of a poem consisting merely of the imitation of a noise that cannot be associated with any lyrical, tragical, or emotional meaning. If some poets indulge in this game we must see in it no more than an exercise, a kind of rough sketch of elements to be included in some given work. The "brekekekex coax" of Aristophanes'* Frogs *is nothing if it is separated from the play from which it derives its comical and satirical connotations. The "iiiii" of Francis Jammes's bird utters for an entire line is a paltry imitative harmony if it is divorced from the poem whose fantasy it helps enhance.*[8]

"Why," asks Apollinaire, "would anyone want to verbally imitate worldly sounds such as the Futurist-like 'whirring of an airplane' when auditive reality will 'always be superior?'"[9] If one were truly interested in creating an illusion of auditive reality, the phonograph could better perform the task. "Conceivably, imitative harmony might play a certain role, but it can serve as foundation only for an art that will make use of machines. For instance, a poem or a symphony in which the phonograph will play a part might well consist of noises artistically chosen and lyrically combined or juxtaposed."[10] Apollinaire, perhaps because of the phonographic quality of his "conversation-poems," foresaw a future where the "new spirit" would be tied up with technology, where the phonograph and cinema would "be the only forms of reproduction, and when as a result poets will enjoy a freedom hitherto unknown."[11]

The inevitable march of technological devices also informed Kurt Weill's attitude toward radio, but instead of providing new tools or conditions to set free a certain class of artists, as Apollinaire thought would be the case for poets, Weill felt that an entirely new art form would come into existence. The meteoric rise of radio in the Weimar Republic prompted Weill to write in 1926, "Within a remarkably short period of time, radio has become one of the most essential elements of public life. Today, it is one of the most frequently discussed topics among all segments of the population and in all organs of public opinion."[12] Yet it was still too early to "foresee what new types of instruments and sound-producing devices may develop," but there could be no "doubt that the preconditions for the development of an independent artistic genre of equal stature [with the other arts] are present." Just as radical proponents of sound film warned against using it simply to reproduce theater, Weill argued that radio must resist "reproduction of earlier artistic achievements" and instead work to develop an autonomous "radio art."[13]

Yet artists who attempted to incorporate technology directly into their work were guaranteed neither technological nor

artistic success. In the avant-garde milieu in Petrograd during 1916, the young Dziga Vertov drew upon his background in writing and music and directed it "into an enthusiasm for editing shorthand records [stenographs] and gramophone recordings. Into a special interest in the possibility of documentary sound recording. Into experiments in recording, with words and letters, the noise of a waterfall, the sounds of a lumbermill, etc., a 'Laboratory of Hearing.'"[14]

He attempted to launch his laboratory with a 1900- or 1910-model Pathéphone wax disc recorder. "I had the original idea of the need to enlarge our ability to organize sound, to listen not only to singing or violins, the usual repertoire of gramophone disks, but to transcend the limits of ordinary music. I decided that the concept of sound included all the audible world. As part of my experiments, I set out to record a sawmill."[15] Presumably, he became frustrated with the poor sound quality, the nonplasticity of the medium, or the stricture of one generation; indeed, he spoke of his transition to film in terms of an inadequacy of phonographic technology.

Upon returning from a train station, there lingered in my ears the signs and rumble of the departing train ... someone's swearing ... a kiss ... someone's exclamation ... laughter, a whistle, voices, the ringing of the station's bell, the puffing of the locomotive ... whispers, cries, farewells ... And thoughts while walking: I must get a piece of equipment that won't describe, but will record, photograph these sounds. Otherwise, it's impossible to organize, edit them. They rush past, like time. But the movie camera perhaps? Record the visible ... Organize not the audible, but the visible world. Perhaps that's the way out?[16]

His inability to "phonograph sounds," in Edison's words, resulted in a desire to "photograph these sounds." Thus, the famed Kino-Eye, the fetish of much post–World War II experimental film, was ironically the result of a frustrated ear.

László Moholy-Nagy also met with technical difficulties. In his 1922 *De Stijl* article "Production—Reproduction," he expressed a desire, already quite common among technologists in the 1880s, to read and write sound through the graphic figures inscribed into a wax record by a phonograph needle.

An extension of [the phonograph] for productive purposes could be achieved as follows: the grooves are incised by human agency into the wax plate, without any external mechanical means, which then produce sound effects ... The primary condition for such work is laboratory experiments: precise examination of the kinds of grooves (as regards length, width, depth etc.) brought about by the different sounds; examination of the man-made grooves; and finally mechanical-technical experiments for perfecting the groove-manuscript score. (or perhaps the mechanical reduction of large groovescript records.)[17]

He later attempted to realize this idea using the visible lines of recorded sound that run along the edge of optical sound film. In *The Sound of ABC*, one attempt in a genre of "drawn sound films" in the European avant-garde during that time, graphic figures such as letters, lines, and profiles were scratched onto the sound track and then played back through the projector. He was known to ask people, "I wonder how your nose will sound?"[18] A film in which drawn sound was employed, along with other techniques of manipulating sound, was *Romance Sentimentale* (1930), certainly the first sound film made *by* Russians, if not *in* Russia. It was made in France and is usually attributed only to Grigori Alexandrov but, arguably, Sergei Eisenstein was also quite involved, even though he persistently tried to dissociate himself from the film because it was such a failure.[19] In particular, the film's opening visual montage of nature scenes, very much in the style of Eisenstein, runs parallel to a radically constructed sound track. The American film critic Harry Potamkin talked with Alexandrov about his use of sound; in these comments we can find, as in the work of Moholy-Nagy, the long-standing desire to merge the technologies of phonography and writing into a new vocal form of sound synthesis.

[Alexandrov] has done in this film a number of things I have thought basic in "playing with sound," such as: running the sound-track backwards, inscribing or designing the sound (sound is after all only inscription). He cut the sound inscription.

. . . Alexandrov, so he told me, has played with the designs of sound by inscribing it directly on the negative and allowing light to make the final registration. . . . By studying the inscriptions closely one may come to an exact knowledge of these inscriptions and read them as easily as one reads musical notes for sound. The inscription for speech and that of sound differ only in the composition of the intervals and a close student will come to recognize the peculiarities of the different impressions. Actually sound will be created without being uttered![20]

Optical film sound was used more successfully, if less adventurously, during the late 1920s in the Weimar Republic for radio works created by Walter Ruttmann ("Weekend") and Friedrich Walther Bischoff ("Hello! You're Tuned to Radio Earth!!"), as discussed in Mark Cory's essay. Similar techniques were used in the 1930s for American animated cartoons and in France beginning in the late 1940s with the *musique concrète* compositions of Pierre Schaeffer, who had begun composing with phonographic disc-cutting equipment before (reluctantly) moving on to magnetic audiotape. Obviously, with the precedence of phonograph lathes and optical sound film in the 1920s, the inheritance from the German military of the magnetic audiotape recorder by post–World War II composers and artists did not have the technologically determinist effect upon artistic practice so often attributed to it; that is, its mere availability did not spontaneously engender an art appropriate to it. Yet there was indeed at least a quantitative increase in activities, ascribed by artists themselves to the easier access and availability of the tape recorder. Most of the activities in the 1950s, however, were restricted to musical practice, for instance, the works of Pierre Schaeffer, Pierre Henry, and others with the *Groupe de Recherche de Musique Concrète*, John Cage, or, within popular culture, the novelty cut-ups of Bill Buchanan and Dickie Goodman and others.

In contrast, the audiotape cut-up collaborations of William Burroughs and Brion Gysin, as discussed in Robin Lydenberg's essay, took a literary tack. The cut-ups were derived from reworked Dada collage techniques, but Burroughs' ideas surrounding them, set forth in his novels, essays, and audiotapes, elaborated a new system of recorded sound that metaphorically extended the idea of recording from a psychobiological *recording* at the level of genetic code—formed by the cipher of the four DNA bases—on out to the larger realms of political conspiracy and spiritist forces. This writing could tie together the proliferating genetic material of viruses, the syntax of language, and the contagion of ideologies, the segmentations of bodies and systems. Audiotape bore an unreadable inscription of reconfigured metallic particles upon its surface that could manifest action at other locations of writing, from genetic code to the clandestine and coded actions of conspiracy. Just hearing certain recorded sounds could change bodies and move people into unwilled action. Although involved in the production of many audiotape cut-ups, Burroughs nevertheless did encounter technical difficulties while moving from metaphor to artistic technology. In the literary cut-ups of newspapers and other texts, Burroughs was able to "write across" the cut, that is, he was able to interject his own words as a bridge or to pare down adjacent words to suture a cut. He could thereby generate and select richer texts, highly resonant in their fragmentation, to introduce as elements within certain novels. He was unable, on the other hand, to write across the cuts of audiotape; a cut severely impaired any mobility of sounds and voices, and any literary impulse, to be productive, had to be surrendered to the winds of chance and to the overlays of profusive interpretation that would furnish it with significance.

The literary and musical activities during the 1950s using magnetic audiotape were accompanied by artworks that manipulated phonograph records themselves, precursors to the avant-garde and hip-hop scratch artists of today. Experimentation continued in the decades following, in cinema, experimental music, das Neue

Hörspiel, text-sound, etc., that cannot be discussed here; however, it can be said that most of the basic premises under which these experiments operated, inherited as they were from nearly a century of under-examined precedent, are presently being challenged. This challenge, moreover, is concurrent with the critiques of modernism, the development of new audio technologies, an increasingly pervasive and militarized din, and with an impending subsumption of sound to an ordinance of information. The emergence of digital recording, synthesis and transmission, and virtual audio in particular, will fundamentally transform the relationships among sound, technology, and art only if new ways of thinking also emerge.

[FIG]URES OF VIBRATION, INSCRIPTION, AND TRANSMISSION

The history of sound in the avant-garde can be described with relative ease when pegged to the familiar figure and functioning of the phonograph, or of any technology for that matter. Beyond that, we can detect three figures of a more abstract character—vibration, inscription, transmission—that begin to account for how sounds are located or dislocated, contained or released, recorded or generated.

VIBRATION

The figure of vibration was most pronounced in ideas of synesthesia,[21] which were very widespread within French circles in the late nineteenth century and within modernism in general; synesthesia cropped up again among Russian artists around the second decade of the century, even as Kandinsky and Kublin moved to the German site of *Der Blaue Reiter* (see Mel Gordon's essay), and then again in the abstract "visual music" films of the 1920s and early 1930s, arriving in mass culture when the abstract filmmaker Oskar Fischinger's input was found accompanying Bach in Walt Disney's *Fantasia*. Nineteenth-century notions of synesthesia—that is, that the operations, affects, and objects of perception intrinsically corresponded to one another—derived from several sources, including neo-Pythagorean ideas wherein the physical laws of vibrating strings reverberated to harmonically map the Universe, occult ideas of a cosmic coordination of essences, and scientific ideas that sound and light were distinguished by calibrated degrees of the speed of vibration. Actual sound occurred in synesthesia almost entirely as elements of speech and music, two sonic areas that *humans uttered* rather than heard. The phonograph in 1877 introduced the fact of worldly sound into culture, yet synesthesia repressed this and instead constructed the sonic attributes of the universe from human agency alone. Phonemes and tones in synesthetic sound systems might correspond to each other, to colors, to the regulated timbre of sound colors, to personality attributes, or to the meaning of phenomenal or cosmological traits. But wherever sound occurred, it was always manifested elsewhere, or other things were manifested through it; a sound had no autonomy but was always relational, being somewhere or something else, a constant deflection that ultimately stretched out to spiritually organize everything from essence to cosmos, always ringing with the voice and music. Synesthesia thereby subsumed the terrestrial world and its inhabitants only in the abstract and only through solipsism.

The constant deflection, deference, and relationality found in figures of vibration had very important consequences for the status of bodies and objects within space, and for the idea of a sound in the arts. Vibrations through their veritable movement generated a structured space and situated bodies and objects in that space. This process of situating did not outwardly transform the bodies or objects themselves, however, it just placed them in an ever-dependent relation within a larger system. Objects and bodies had little individual autonomy, and in the process of placement there were no mutations or fusions, and no surfaces were disrupted from either external vibrations or internal emanations, for this would have drawn attention to an individual situation. Because of the infiltrating and transmissive etheriality of vibrational space, the terrestrial anchoring of objects and bodies was largely ignored. Individual events of sound were subject to the same fate as objects and bodies, such that they

were not entertained through concepts of objecthood and corporeality, as commonly done within technological discourses during the same time. And the idea of an autonomous "sound" had to wait for the leverage of phonography to be felt within culture. A decade into the twentieth century, at the cusp of the major cultural incursion of inscriptive figures, Marcel Duchamp, in his conceptual approach to sound and aurality, satirized the inability of vibrational space to generate objects and bodies with his idea for an acoustic Venus de Milo, a life all her own but existing in neither stone nor flesh.[22] Raymond Roussel similarly satirized synesthesia; in one of his novels, the names of flowers called out into a ravine echo back accompanied by their respective scents. This, of course, did not prevent the concurrent or subsequent repetition and elaboration of synesthetic ideas within the arts.

Although most figures of vibration evaporated out into the heavens, it should be noted that an exception can be found in "Ka" (1915), a story by the Russian Futurist poet Velimir Khlebnikov. The story employed the type of determinism and universality found in synesthesia, but at least it was sufficiently eccentric and ecological that it managed to stay on earth. Ka is a mythic figure, a time traveler capable of taking different forms, "the soul's shadow, its double, its envoy to the world some snoring gentleman dreams of."[23] Well into the story Ka is a bird flying near the source of the Nile, where he joins a circle of apes who sit around a fire reminiscing about the Roc bird. Then Ka fashions an oracular lyre, a remarkable instrument using a Pythagorean correlation between musical tone and historical chronology, derived from Khlebnikov's "Tables of Destiny," a set of calculations mapping the temporal relationships of past events.

Ka set an elephant tusk on end and at the top, as if they were pegs for strings, he fastened the years 411, 709, 1237, 1453, 1871; and below on the footboard the years 1491, 1193, 665, 449, 31. Strings joined the upper and the lower pegs; they vibrated faintly.[24]

Ka asks a beautiful female ape to sing, and she takes up the lyre and begins singing a song of the Fates.

She moved her hand across the strings; they sounded the thunder boom of a flock of swans that settles as one body onto a lake.

Ka observed that each string consisted of six parts, each part consisting of 317 years, 1902 years in all. And also that the top row of pegs indicated years when the East attacked the West, while the pegs at the lower end of the strings indicated an opposite movement, the West against the East. In the top row were the Vandals, Arabs, Tatars, Turks, and Germans; below were the Egyptians of Hatshepsut, the Greeks of Odysseus, the Scythians, the Greeks of Pericles, the Romans. Ka attached one additional string: between the year 78, the invasion of the Scythians of Adia Saka, and the year 1980—the East. Ka studied the possibilities of playing on all seven strings.[25]

INSCRIPTION

While figures of vibration head for the heavens, figures of inscription pull sounds down to earth, much like Rabelais' "frozen sounds" that sit, the size of plums, upon the ground in a variety of colors, waiting for the spring thaw. One thing that attached inscripted sound to the earth's surface was its tie to technology. There was no effectively new technology associated with figures of vibration; it depended instead on the old technology of the ancient Greek monochord and other stringed instruments for its elaboration. Figures of inscription, on the other hand, were associated with the phonograph of the late nineteenth century and the phonautograph not too long before it. The cultural implications of phonography were profound for the reasons stated in the previous section (see also my essay on Raymond Roussel and phonography in this volume), and these implications could be as evident as the jagged line that the stylus etched onto lampblack, paper, tin, or wax. First of all, the acoustic events in synesthesia only carried weight in concept because in actuality they consisted merely of conventionally pitched musical

tones and phonemes. An inscripted sound could be any sound, even a very distant or dead one, and the whole process of inscription was in no way limited to the prosaic sounds rehearsed within synesthetic systems. Inscripted sounds were, on the contrary, apperceptual, empirical, scriptural, and technological, capable of being seen, read, written, and drawn directly.

That the mechanical etching of any acoustic event could be seen spawned the idea in the late nineteenth century that the markings could be read and written and, therefore, could constitute a mechanically precise alphabet of *all sounds,* all that had been withheld and unexplored, an onset of plenitude that signaled anything from an unprecedented candor to the new imperial order. The notation of sound in musical notation and phonetics was crude in comparison, dependent as it was upon culture and interpretation, whereas phonography appeared to be the direct product of mechanics. Even conventional alphabets appeared to be superseded by the phonographic collapse of speech and writing into visible speech and vociferous graphemes. This hope against hope, premised on earlier ideas of universal alphabetics, themselves based upon the hope that the Biblical lost language had just been misplaced, was confirmed by the way sound was finally brought into the visualist and scriptural logic of Western culture. The phonograph promised that all and any sound whatsoever could be created "without being uttered!" as Alexandrov enthused.[26] "Without being uttered" meant not spoken, not played musically, especially not by wind instrument. Inscripted sound, in other words, meant something distant from the conceit of nothing-but-consciousness, from the necessity of human agency and metaphysical presence. This was a sound that could be given up to the content of the world exceeding human concerns alone, capable of invoking an ostensible "nature" that was not uttered within the familiar bounds of human speech or musical performance, while at the same time being subjected even more effectively to the machinations of material culture.

There is obviously a major distinction, however, between the work of someone like Raymond Roussel and others during the early avant-garde, where sound is written on the *surface* of objects, and that of William Burroughs after World War II, where writing occurs submerged within a secretive *interior,* such as the site of genetic code, or in a way not easily readable, such as the reconfigurations of metallic particles on magnetic audiotape. It becomes difficult, after all, to read things at a subcellular scale without an electron microscope; but it is just this type of scientistic thread that can enhance any agenda: anything can grow from a seed you can't see. There is another important relationship between the submerged inscription of sound and objects and bodies: inscription establishes the concreteness of "surfaces" in the interior that, in the process of reading or writing, may break through the skin or reconfigure the body (note the anomalous bodies in Burroughs' writings). Furthermore, as with genetic engineering, writing is a seed from which entire bodies may grow, but there also exists the possibility of severe mutation, injury, and destruction, set off simply by the act of reading and writing, of bringing the text to light, of turning a body inside out to expose the inscription, a violence that accompanies the technologization of the body and the abeyance of sonic movement.

TRANSMISSION

The most pronounced impression produced by figures of vibration was that of spatiality, whereas inscription reduced space into impressions upon a surface. Despite the fact that vibrational space was ultimately an ordered one and could exist in idealized representation alone, it did simulate the acoustic space that sound both creates and inhabits. The problem was that actual acoustic space included bodies and objects rarely positioned in harmonic relationship with one another, and rife among real acoustics were noises that raise havoc with any attempt to structure a system. Inscription technologically incorporated noises and mundane sounds of actual

objects and bodies but at the expense of diminishing the "vibrancy" of space, its expansiveness and mobility, its objects and bodies, into cipher, stasis, and autonomy. Figures of vibration lived in the space of an imaginary world, whereas figures of inscription destroyed the space of the real world.

Figures of transmission combined aspects of both vibration and inscription, fusing the spatial features of vibration with the objecthood and corporeality of inscription, but exceeding them both in terms of complexity. Transmission could situate objects and bodies in inharmonic, noisy, and terrestrial relations without consuming their autonomy. In the harmonics, chromatics, and syllabic/phonetics of vibrational space, the autonomy of an object was always consumed by the existence of another object being manifested through it from a distance; whereas in transmissional space the object was ostensibly replicated in itself as it was transported over an equivalent distance; that is, disem*bodi*ment meant that an object or body existed in two places at once, as opposed to object or body referring to a corresponding color, tone, affect, etc. Vibrational space that had existed only in representation was given breadth and depth once again by a *signal* silently crisscrossing space, bearing both sonic content and the objects that had been demobilized by inscription in a variety of manners, internal and external, point-to-point and centripetal narrowcast, broadcast, to and from an isolated inscription, to and from inscripted objects and bodies, to and from objects and bodies, and to and from the spaces they inhabit and that inhabit them. In other words, transmission was basically the return and invigoration of objects and bodies that had been fixed by inscription to the space implied by vibration.

Transmission also implied a proliferation and differentiation of objects and situated them in a totalizing notion of space. This particular characteristic can be explained by distinctions between phonography and wireless/radio. Phonography established the objecthood of sound and the ability to replicate a myriad of objects, but it did not strongly imply sounds from a distance. Wirelessness immediately meant great distances, thus all the references to the expanses of the oceans, to crowds, to other lands, and to the otherness of the unexplored globe. This globalness was finally determined, however, within the framework of where the technology was footed politically and historically. Yet, this newfound and newly populated space was not acoustic; the distance between replicated objects was a vacuum that collapsed space to an ideal of instantaneous transmission and reception, a communication without mediation. Sound existed at either end(s), but in between there was nothing but silence, reduced to the trajectory of a signal. This structure was anthropomorphized in several accounts of radio and transmission in general to ideas of unmediated communication, thought transference, and signal as corporeal sensation. A technology that had already been heavily invested with human fears and desires was elevated to vitalistic, prosthetic, and necrotic tropes as when, for instance, F. T. Marinetti and Pino Masnata, in their 1933 *La Radia* manifesto included in this volume, proposed an artistic materiality that would be "a pure organism of radio sensations," or when Khlebnikov in "The Radio of the Future" foretells of long-distance synesthetic healing without medicine and the transmission of an anthem of strength in production: "It is a known fact that certain notes like 'la' and 'ti' are able to increase muscular capacity, sometimes as much as sixty-four times, since they thicken the muscle for a certain length of time. During periods of intense hard work like summer harvests or during the construction of great buildings, these sounds can be broadcast by Radio over the entire country, increasing its collective strength enormously."[27]

Obviously, that transmission was restricted to earthly air did not mean that its was immediately wrested from the cosmos; instead, in early encounters one can find quick recourse to the spiritist notions of vibrational space. The Polish artist Stefan Themerson was capable of recuperating radio noise in a figure of vibration: "When I was 14 (in 1924) I built myself a wireless-set ... what fascinated me ... more than the fact of hearing a girl's singing voice coming to my earphones from such strange places as Hilversum, was the

noise, to me the Noise of the Celestial Spheres, and the divine interference-whistling when tuning. It became an instrument for producing new, hitherto unheard sounds, which at the time no person would have thought had anything to do with 'music.'"[28]

In another instance, André Breton, writing his "Ode to Charles Fourier" in 1945, late in the age of radio, teased the grand harmonies of Fourier down from the stars and navigated them across the diapasonic seas of an invocatory keyboard:

Fourier what have they done with your keyboard
That responded to everything with a chord
Setting by the movements of the stars
from the capers of the smallest boat on the sea
to the great sweep of the proudest three-master
You embraced unity you show it not as lost but as totally attainable[29]

Just thinking about this oceanic expansion to all ends of the earth and the possibility for its instantaneous and simultaneous communication to a single moment of consciousness meant that the potent force of an unstructured, chaotic space was sent hurtling down onto individual means of expression, splintering them into fragments. Marinetti's "wireless imagination" credited wireless telegraphy with the collapse of syntax and analogy in *parole in libertà*. All conventions of relationality, traditionally confined as they were to local and manageable structures and comparisons, would break down once they were bombarded with a global infinitude of possible relations, all arriving at once with a newfound speed having "no connecting wires."[30] Wirelessness also operated less violently in Guillaume Apollinaire's 1916 story "The Moon King." In it a traveler seeking shelter is drawn into the subterranean passages of a mountain, where he hears sounds from a remote room. He finds there an elderly man he recognizes as King Ludwig II of Bavaria, thought to be drowned, sitting at an unusual keyboard instrument. When a key is pressed, Japan at dawn is heard.

The flawless microphones of the king's device were set so as to bring in to this underground the most distant sounds of terrestrial life. Each key activated a microphone set for such-and-such a distance. Now we were hearing a Japanese country side. The wind soughed in the trees—a village was probably there, because I heard servants' laughter, a carpenter's plane, and the spray of an icy waterfall. Then another key pressed down, we were taken straight into morning, the king greeting the socialist labor of New Zealand, and I heard geysers spewing hot water. Then this wonderful morning continued in sweet Tahiti. Here we are at the market in Papeete, with the lascivious wahinees of New Cytheria wandering through it—you could hear their lovely guttural language, very much like ancient Greek. You could also hear the Chinese selling tea, coffee, butter, and cakes. The sound of accordions and Jew's harps.[31]

Then a train in the United States, urban noises of Chicago, vessels along the Hudson, prayers for Christ in Mexico, carnival in Rio, a teacup in Paris, a chorus in Bonn, hand games in Naples, and finally ten o'clock in Tripoli. Then the "king's fingers ran over the keys at random, simultaneously raising all the sounds of this world which we, standing still, had just toured aurally."[32]

Edgar Varèse aspired unsuccessfully to use the radiophonic space that Apollinaire could only imagine in his unrealized symphony *Espace*, initiated in Paris in 1929 and occupying him for over a decade. In an argument sketched out in 1941, he wrote,

Voices in the sky, as though magic, invisible hands were turning on and off the knobs of fantastic radios, filling all space, criss-crossing, overlapping, penetrating each other, splitting up, superimposing, repulsing each other, colliding, crashing. Phrases, slogans, utterances, chants, proclamations. China, Russian, Spain, the Fascist states and the opposing Democracies all breaking their paralyzing crusts.

. . . I suggest using, here and there, snatches of phrases of American, French, Russian, Chinese, Spanish, German revolutions like shooting stars, also recurring words poundingly repeated like hammer blows or throbbing in an underground ostenato, stubborn and ritualistic.[33]

In his biography of Varèse, Fernand Ouelette went a little further in

explaining his plans: "Varèse had imagined a performance of the work being broadcast simultaneously in and from all the capitals of the world. The choirs, each singing in its own language, would have made their entries with mathematical precision. The work would have been divided up into seconds, with the greatest exactitude, so that the chorus in Paris—or Madrid, or Moscow, or Peking, or Mexico City, or New York—would have come onto the air at exactly the right moment."[34] Similarly, the practice of German Hörspiel during the Weimar Republic is replete with works that use the radio to collapse disparate reaches of the world into a unity, as discussed in Mark E. Cory's essay, and many works that play themselves out over the ocean for purposes spanning global solidarity to radiophonic *Lebensraum*.

In transmission the unknown expanses of the psyche were as intriguing and explorable as those of the earth. They two were brought together in the psychotechnics of Surrealist automatism. Inscriptive, stenographic practices took down the "magical *dictation*" from the "mouth of darkness" (Breton), the noisy gate to the unconscious,[35] but the action of the unconscious itself, its "voice," was delivered to the Surrealist by way of a radiophonic narrowcast. Even the literary voice privy to having overheard the unconscious could be described along these lines: in his *Treatise on Style* (1928), Louis Aragon detailed the physiognomy of someone unable to hear such a voice:

... your ear trimmed with a festoon of broderie anglaise, your ear the color of calves' feet, your tender ear of rubber, your ear, ever as waxy and buzzing as a hive, your little dirty cartilage that looks more like a poorly puffed fritter than a phonograph horn ...[36]

But when the ear that can hear is equipped with a sensitivity that radiophonically spans the oceans,

... more and more able to grasp in the grassy hollow of sentences the clear tinkling of a clinked glass that causes a man to die at sea each time, and the same ceremony takes place, the sailors line up at the flag at half-mast, plop! the bag in the waves carries the sleeper away.[37]

Likewise, the underground oracular voice of the unconscious was radiophonically transformed into a vast subterranean region that could be heard residing on the other side of the earth's surface. In discussing the "timbre" of Lautréamont's style ("I confer a very elevated meaning on the word style"[38]), Aragon describes the work of the intellect as an acoustic mining:

When the worker who was digging into the bowels of the earth—whether in knotty Asia or near the Italian sea, where the dust is lightest because it is made with the powder of statues—when this worker suddenly hears the steel of his pickax ring strangely, he bends over, questions the distant depth, and thinks he hears a dirge. To the bottom of the pit he glues an ear that is used to romances. What is this perpetual rumbling? A monstrous parade, an enormous troop which nothing wearies. Profuse resonance of subterranean carriages. The ebb and flow of hidden waters, where everything merges.[39]

Aragon's mining strikes an aqueous metaphor, which continues to flow while he describes the automatic speech of the poet Robert Desnos during the Surrealist "period of sleeps": "He spoke like no one speaks. The great common sea suddenly found itself in the room, which was any old room with its surprised utensils."[40] Here, the subterranean waters "where everything merges" are themselves transmitted into the room through the buccal spigot of a "sleep talking" Desnos, as though he were but a puncture on the surface of the earth and of consciousness, a breach through which can be heard "the echo of what we are tempted to consider as universal conscience" (Breton).[41] Desnos was such an avid "sleeper" that he eventually pressed the patience of his listeners too far, as evidenced by the episode when an intolerant Paul Eluard, to awaken Desnos, emptied a jug of water onto his chest. In 1932, several years after leaving the Surrealist ranks, Desnos replaced the transmission technology of his own body for that of radio broadcasting proper, working in

Information et Publicité to create what he thought of as either an extension of poetry or a return to it: radio advertising. "I threw myself passionately into the almost mathematical, yet intuitive, work of adapting words to music, of fabricating sentences, proverbs and mottoes for advertising, the primary exigency of this work being a return to the people's taste in the way of rhyme."[42] As his wife, Youki Desnos, recounts, "Robert's ambition—and how many times he repeated it to me—was outside of his pure poetic work, to create songs which could sweep through the streets, to be whistled by a boy pedaling a carrier tricycle, for example, or murmured from ear to ear by lovers."[43] In other words, Desnos abandoned the "universal consciousness" that populated the unconscious for the crowded unconscious of "the People." Goods and services lodged in the bodies of jingles and songs were recorded into the minds of thousands of French people in order to be irrepressibly repeated. Desnos thereby socialized himself by radiophonically transmitting an entirely denatured "period of sleeps" and extending the transmitter from the psychotechnical device of his own body to the crowd.

In terms of historical sequence, figures of transmission might seem like a return of sorts to the space of vibrations and objects and bodies of phonography, had these very figures themselves not been available since the late nineteenth century as well. A more complete account of their histories will have to wait for another occasion. They have been proposed here, along with the outline of art and phonography, as methods to cohere a wide range of scattered events and ideas; the cohesion need not be a narrative one. The following essays certainly supply enough information and analysis to gain further bearings on this history and will hopefully provoke research into the field of sound and aurality, sound recording and radio in the arts, that will delve into greater detail, propose other ways of theoretical and historical understanding across the arts in general, and engender a complex sense of artistic possibility among practitioners.

NOTES

1. For a discussion of the discursive and technological relationship of music to the aural arts see Douglas Kahn, "Track Organology," *October* 55 (Winter 1991).

2. This line of thought has been introduced by Frances Dyson in "Notions of Acoustic Truth," the unpublished abstract for her Ph.D. dissertation from the University of Technology, Sydney, 1990.

3. F. T. Marinetti, "Destruction of Syntax—Wireless Imagination—Words in Freedom," *Lacerba*, 11 May and 15 June 1913, translated in Richard J. Pioli, *Stung by Salt and War: Creative Texts of the Italian Avant-Gardist F. T. Marinetti* (New York: Peter Lang, 1987), p. 45.

4. F. T. Marinetti, *Selected Writings*, ed. R. W. Flint (New York: Farrar, Straus and Giroux, 1972), pp. 332–333.

5. F. T. Marinetti, "From the Café Bulgaria in Sofia to the Courage of the Italians in the Balkans and the Military Spirit of Désarrois," in *Selected Writings*, p. 332.

6. Guillaume Apollinaire, "The New Spirit and the Poets," published as an addendum in Francis Steegmuller, *Apollinaire: Poet Among the Painters* (Freeport, NY: Books for Libraries Press, 1971), p. 280.

7. Ibid., p. 281.

8. Ibid., pp. 281-282.

9. Ibid., p. 282.

10. Ibid., p. 281.

11. Ibid., p. 279.

12. Kurt Weill, "Radio and the Restructuring of Music Life" (1926) in *Writings of German Composers*, ed. Jost Hermand and James Steakley (New York: Continuum, 1984).

13. Ibid.

14. Dziga Vertov, *Kino-Eye: The Writings of Dziga Vertov*, ed. Annette Michelson (Berkeley: University of California, 1984), p. 40.

15. Dziga Vertov, "Speech of 5 April 1935," cited in Seth Feldman, *Evolution of Style in the Early Work of Dziga Vertov* (New York: Arno Press, 1977), p. 13. For an astute comparison to Russolo's work, a source which influenced Vertov, refer to Feldman's comments on pp. 12–15.

16. Ibid., p. 40.

17. See Krisztina Passuth, *Moholy-Nagy* (New York: Thames and Hudson, 1985), p. 289.

Sibyl Moholy-Nagy, *Moholy-Nagy: eriment in Totality* (New York: Harper rothers, 1950), pp. 68, 97. Although it nfortunate that this film is lost, the ıd generated by this technique would ›ably have resembled a bird whistle of s, alternating with thin, scratchy ıds.

Luis Buñuel concurs: "Eisenstein's ıds have tried to blame Alexandrov for debâcle of the dreadful and shoddy luction of *Romance Sentimentale*. But I Eisenstein making it with my own . since he was shooting it on the stage : to me when I was making *ge d'or*." (Cited in Francisco Aranda, *Buñuel: A Critical Biography* [New c: Da Capo, 1976], p. 87.) A full unting of Eisenstein's participation in film, along with his other early failures frustrations relating to sound film, d not only fundamentally disrupt ons of Eisenstein's position on sound but could also, because of his reliance ural, musical, and synesthetic meta-s throughout his theoretical writings, ire a reformulation of much more.

Harry Potamkin, "Playing with ıd," in *The Compound Cinema: The Writings of Harry Alan Potamkin* (New : Teachers College Press, Columbia ersity, 1977), pp. 86–88.

Synesthesia exists only in a privatized ulation and even then within select ndividuals, as evidenced by the varia- of synesthetic systems listed in Gordon's essay. The attempts to socialize these solitary perceptions into a communicative mode could only survive among ideologies of the artist as an innate generator of languages.

22. See Douglas Kahn, "Acoustic Sculpture, Deboned Voices," *Public* (Fall/Winter 1990/1991), pp. 23–34.

23. Velimir Khlebnikov, "Ka," in *The Collected Works of Velimir Khlebnikov, Volume 2: Prose, Plays and Supersagas*, trans. Paul Schmidt, ed. Charlotte Douglas (Cambridge, MA: Harvard University Press, 1989), p. 56.

24. Ibid., p. 67.

25. Ibid., pp. 67–68.

26. Harry Potamkin, "Playing with Sound," p. 88.

27. Velimir Khlebnikov, "The Radio of the Future," in *The Collected Works of Velimir Khlebnikov, Volume 1: Letters and Theoretical Writings*, trans. Paul Schmidt, ed. Charlotte Douglas (Cambridge, MA: Harvard University Press, 1987), p. 395.

28. Stefan Themerson, letter to Henri Chopin, reprinted in the review *Ou* 36–37 (c. 1969).

29. André Breton, "Ode to Charles Fourier," excerpted in Marcel Jean, ed., *The Autobiography of Surrealism* (New York: The Viking Press, 1980), p. 404.

30. Marinetti, *Stung by Salt and War*, p. 48.

31. Guillaume Apollinaire, "The Moon King," in *The Poet Assassinated*, trans. Ron Padgett (San Francisco: North Point Press, 1984), p. 80.

32. Ibid., p. 81.

33. Dorothy Norman, "Edgar Varèse: Ionization—Espace," *Twice a Year*, (Fall-Winter, 1941), pp. 259–260.

34. Fernand Ouellette, *Edgard Varèse* (London: Calder & Boyars, 1973), p. 132.

35. André Breton, "Entrée des médiums" (1922), excerpted and translated in *The Autobiography of Surrealism*, ed. Marcel Jean (New York: The Viking Press, 1980), p. 101.

36. Louis Aragon, *Treatise on Style* (1928), trans. Alyson Waters (Lincoln: University of Nebraska Press, 1991), p. 106.

37. Ibid.

38. Ibid., p. 105.

39. Ibid., pp. 103–104.

40. Ibid., p. 104.

41. Breton, "Entrée des médiums," p. 101.

42. Quoted from Robert Desnos, *Etat de veille (Waking State)* in Mary Ann Caws, *The Surrealist Voice of Robert Desnos* (Amherst: University of Massachusetts Press, 1977), p. 9.

43. Youki Desnos, "Desnos poète populaire," *Simoun*, "Robert Desnos" issue (1956,) pp. 52–54, quoted in Steven Kovács, *From Enchantment to Rage* (Rutherford, NJ: Fairleigh Dickinson University Press, 1980), p. 52.